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ABSTRACT

This document contains three symposium papers on advances in distance learning. "The Adoption of Computer Technology and Telecommunications: A Case Study" (Larry M. Dooley, Teri Metcalf, Ann Martinez) reports on a study of the possible applications of two theoretical models (Rogers' Diffusion of Innovations model and the Concerns-Based Adoption Model of Hall, Wallace, and Dossett) in helping distance learning staff learn to use technology effectively. "Distance Education: Examining Emerging Standards and Instructional Practice via Videotaped Content Analysis" (Carmeta Tate-Blake, Jo D. Gallagher, Douglas H. Smith) presents the results of a study that revealed that few of the emerging practices suggested by proponents of distance learning and distance educators were currently being practiced. "Critical Components of Distance Education Partnerships between Two-Year Colleges and Business and Industry" (Edward "Ted" Raspiller) is the report of a multiple-case study that was undertaken to do the following: (1) to identify critical characteristics of program planning, funding, evaluation, and policy development in distance education partnerships, and (2) to create the framework for a program development model for planning and refining distance education training programs. (MN)

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## Advances in Distance Learning

**Chair: Martin Mulder, University of Twente, The Netherlands**

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*Larry M. Dooley, Texas A&M University*

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2 - 2 Distance Education: Examining Emerging Standards and Instructional Practice via Videotaped Content Analysis

*Carmeta Tate-Blake, Florida International University*

*Jo D. Gallagher, Florida International University*

*Douglas H. Smith, Florida International University*

2 - 3 Critical Components of Distance Education Partnerships between Two-year Colleges and Business and Industry

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# The Adoption of Computer Technology and Telecommunications: A Case Study

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*Helping staff use technology effectively may be the most important step in realizing the current and future investments in technology. To address the lack of technology training and staff's reaction to computer technology usage, this study used two theoretical underpinnings: Diffusion of Innovations (Rogers, 1983) and the Concerns-Based Adoption Model (CBAM) (Hall, Wallace, & Dossett, 1973). This framework provides guidance for professional development strategies for all training settings.*

*Keywords: Telecommunications, Computer Technology, Case Study*

Since January 1997 the Center for Distance Learning Research (CDLR) has provided technology training to teachers in over 50 school districts in Texas and New Mexico. Most are small, rural districts and many are recipients of grants from the Texas Telecommunications Infrastructure Fund (TIF) and Technology Integration in Education (TIE) initiatives that support technology implementation.

Training is usually conducted at the school district sites by two trainers. Up to 20 teachers may participate in training sessions, provided that there is a computer workstation per participant. The CDLR encourages districts to use the train-the-trainer model, so CDLR trainers conduct a series of training sessions with a group of master teachers who will then train their colleagues.

The only one of these recommendations that has been strictly enforced and consistently followed is having one computer workstation per participant. In spite of strong recommendations to keep participation to 20 or fewer master teachers, many small district administrators insist that everyone be trained. The consequence is a large group of people with a large range of proficiency levels and a large range of training needs that often should be dealt with on a one-to-one basis. Unfortunately, as the group gets larger the amount of one-to-one hands on assistance gets smaller. Also, when administrators mandate that everyone be trained, many participants resent having to participate in training, particularly if it occurs on a Saturday or during the summer.

The CDLR had developed a training brochure, entitled "Teaching and Learning with Technology," with 11 training modules from which to choose. The brochure states, "These technology training modules are designed to help teachers (trainers) develop the skills and strategies for using emerging technologies in instruction and management." (1997, CLDR) The brochure was used as a menu and helped clients to identify training needs, but CDLR trainers have also conducted needs analyses to customize training to needs beyond menu offerings.

During the first year, most of the training focused on the brochure menu items that were organized as modules, and included basic computer applications. In 1998, training emphasis moved from basic computer applications to telecommunications applications. Using the Web-Across-the-Curriculum became the most popular training topic, even for those with little or no experience with technology. A second fast growing training topic is "Web Publishing" where individuals can develop skills and strategies for adapting course materials to the Web. To respond to the growing interest in distance learning, we redesigned our brochure from its modular format into three strands in the areas of Technology and Teaching, Distance Learning, and Putting It All Together. Each of these strands incorporates several topics. The new brochure states that, "These strands are designed to help educators develop skills and strategies for a distance learning environment." (1998, CDLR).

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## Theoretical Framework

The Office of Technology Assessment (OTA) issued a report on the integration of technology in our nation's schools (1995). Schools in the United States had 5.8 million computers for use in instruction, about one for every nine students. While 75 percent of public schools had access to some kind of computer network, and 35 percent of public schools had access to the Internet, only 3 percent of instructional rooms were connected to the Internet (OTA, 1995). Currently, most funds for technology have been spent on hardware and software. On average, schools have devoted no more than 15 percent of technology budgets to training. Helping staff use technology effectively may be the most important step in realizing the current and future investments in technology (OTA, 1995).

To address the lack of technology training and staff's reaction to computer technology usage, this study used two theoretical underpinnings: Diffusion *of Innovations* (Rogers, 1983) and the Concerns-Based Adoption Model (CBAM) (Hall, Wallace, & Dossett, 1973). This framework provides guidance for professional development strategies for all training settings. It is imperative that we further adopt computer technology and telecommunications as an innovation in business, industry, government, health care, etc. As more and more entities mover toward technology driven training, and follow-up studies, we must understand when and if transfer is taking place.

Rogers defined an innovation as an "idea, practice or object that is perceived as new by an individual or other unit of adoption" (1983, p. 11). Diffusion is the "process by which an innovation is communicated through certain channels over time among the members of a social system" (Rogers, 1983, p. 10). The innovation-decision process is the "process through which an individual (or other decision-making unit) passes from first knowledge of an innovation, to forming an attitude toward the innovation, to a decision to adopt or reject, to implementation of the new idea, and to confirmation of this decision" (Rogers, 1983, p. 20). This process consists of a series of actions and choices over time with varying stages. There are also influences on the process, such as the prior conditions, characteristics of the decision-making unit, the perceived characteristics of the innovation, and communication channels.

Because all individuals in a social system do not adopt an innovation at the same time, it is helpful to place individuals into adopter categories, (classifications of members of a system on the basis of their innovativeness). The innovativeness dimension, as measured by the time at which an individual adopts an innovation, can be partitioned into five adopter categories: innovators, early adopters, early majority, late majority, and laggards (Rogers, 1983).

Another adoption model, Concern-Based Adoption Model (CBAM), was developed by Hall, Wallace and Dossett in 1973. The concept of "concerns" has been described as "the composite representation of the feelings, preoccupation, thought, and consideration given to a particular issue or task. Depending on the personal make-up, knowledge, and experience, each person perceives and mentally contends with a given issue differently; thus there are different kinds of concerns" (Hall & Hord, 1987, p. 59). This model views change as a process rather than an event and examines the various motivations, perceptions, attitudes, and feelings experienced by individuals in relation to change (Hall et al., 1973). Change entails an unfolding of experience and a gradual development of skill and sophistication in use of an innovation. An individual's concerns can move in developmental progression from those typical of non-users of an innovation to those associated with fairly sophisticated use.

The theory and research of Hord and associates showed that there was a general pattern to the intensity of the different stages of concern, and that changes in this pattern can be linked to the change process as it unfolds (Hord, Rutherford, Huling-Austin & Hall, 1987). At the beginning of a change process, the typical "non-user" has concerns that are relatively high in *Awareness*, *Information*, and *Personal* (self-concerns). Non-users or low users are more concerned about gaining information about the innovation and about how change will affect them personally. As they begin to use the new program or innovation, concerns become more intense in the area of *Management* (task concerns). As a teacher becomes more experienced and skilled with an innovation, the tendency is for concerns at the lower stages to decrease in intensity while those in higher stages such as *Consequence, Collaboration* and *Refocusing* become more intense (impact concerns).

Concerns theory and research reveal that concerns change over time in a fairly predictable, developmental manner (Hall & Hord, 1987; Hord et al., 1987). If we can predict how concerns will change throughout the phases of the change process, we can design in-service and other intervention activities to address those needs.

The success or failure of a training innovation clearly rests with the trainers. Training programs must integrate technology very early to be effective. Train-the-trainer programs must model how to use the technology in the teaching and learning process. The idea is not only to teach them how to use the hardware and software, but how to integrate it seamlessly into the curriculum. Otherwise, it doesn't work..."(Siegel, 1994, p. 34). Thus, hardware,

software, and professional development share an interdependent relationship (Dyrli & Kinnaman, 1994; OTA, 1995).

**Purpose of the Study**

The purpose of this study was to determine the role of professional development and training in the adoption of computer technology and telecommunications in a training case study. Research questions included:

1. What were the percentage of concerns that were self, task, and impact of high, middle and low-using computer technology and telecommunications users?
2. To what extent did the findings match or not match Rogers' diffusion of innovation research (1983) and the Concern-Based Adoption Model (Hall, Wallace & Dossett, 1973) for innovation and diffusion?
3. What were the factors that made an impact in the diffusion process and how might these training environments further enhance professional development and interventions for diffusion?

**Case Description**

Calvert ISD is a good example of a complex partnership between the CDLR and a school district. The partnership includes technology planning and program development, technical support, and training for teachers, administrators and technology coordinators.

Calvert, in east Texas, is approximately half way between Dallas and Houston. It has a population of approximately 2,000 and is located about 30 miles north of the CDLR, and is 30 miles from the nearest moderate sized community. Both Robertson County and the community of Calvert are rural in nature with a farm-based economy. Calvert has no non-agricultural based industries. The nature of the terrain limits farming, so the land is basically used for grazing by food animals.

The school district has two schools and an enrollment of 333 total students. Over 92 percent of students have been identified as economically disadvantaged based on eligibility for free and reduced priced school lunches. Ethnic diversity of students is as follows: 81 percent African American, 10 percent Latin American and 9 percent European American.

The Texas Education Agency categorizes Calvert ISD as a "property poor" district and has poor physical facilities. For example, the junior high/high school building was constructed in 1920. With a small economic base and low tax income, Calvert had lagged behind other districts in implementing an effective technology program prior to 1997. Prior to 1997, technological assets at the high school consisted of 35 computers in laboratory settings, none of which were capable of accessing the Internet.

The overriding problem for Calvert students and community members continues to be the perpetuation of poor academic achievement from generation to generation. This is evident through minimal ability to meet state academic standards. The district's most serious academic deficiencies are in reading and mathematics as evidenced by scores on the Texas Assessment of Academic Skills test (TAAS). In spring 1997, only 45.8 percent of students met minimum expectations on the reading portion of the TAAS, and 38.7 percent met minimum expectations on the mathematics portion.

In fall 1996, the CDLR began providing technology planning assistance to Calvert ISD. District administrators had drafted a proposal for Technology Infrastructure Funding, and needed help in editing and refining the proposal and developing its technology component and budget. The technology planning and grant writing process involved close working relationships between CDLR staff and the Calvert superintendent and secondary principal, several visits occurred between the two sites. Calvert met the two TIF selection criteria in that more than 70 percent of its students are economically disadvantaged and the district did not have direct connection to the Internet at the time of the proposal. Consequently, the junior high/high school campus received a TIF grant in the amount of $385,000 in the first round of TIF funding.

Calvert ISD contracted with the CDLR to provide both technical support and training. Technical support included installation of their local area network and computer equipment. In addition to a fully networked laboratory, a computer with Internet access was installed in every classroom, and the principal's office. The training component included at least 10 days of teacher training, 2 days of administrator training, and 4 days of technical training. The teacher training dates were scheduled before the technology was completely installed.

Administrator training included system administration and expansion strategies as well as development of strategies for supporting teachers in integrating technology into instruction and management. Administrator training occurred in a 2-day workshop conducted at the CDLR. The Project Manager and Technology Coordinator received

at least 4 days of technical training that included skills and knowledge for maintaining equipment and software, such as routine maintenance, administrative tasks, troubleshooting procedures, and system upgrading procedures. Technical training occurred informally as needed during visits to the campus by CDLR technical personnel.

The first three teacher training engagements were completed before the technology system was actually installed at the school site. This group was very excited about receiving the grant and the administration hoped to engage the staff in training while the excitement was sustainable. Ten administrators and teachers came to CDLR for one day of initial training in May 1997. Two trainers took the group through the *Using Windows 95* curriculum. A month later, one of the trainers met with the high school principal and provided two hours of one-on-one training on Windows 95.

In July, thirteen teachers and administrators attended two days of training held in the computer lab of College Station High School. Two trainers took the group through *Point and Click (Navigating in Windows 95 Environment), Word Processing with Word 97, and Classroom Presentations with PowerPoint* curriculum. The evaluations from these sessions of training were very positive and enthusiastic, both of the program and the trainers. Feedback included comments that indicted that some participants needed to move through the materials a little slower, and all participants indicated that they needed time to practice the new skills. Evaluation and feedback from the participants remained positive throughout the training sessions.

By the scheduled August training, the computer lab had been installed in Calvert ISD. Two days of training were included in the in-service meetings just prior to the beginning of the fall semester. Two trainers took sixteen participants through a review of word processing skills and *Spreadsheets using Excel 97* curriculum. The review proved to be very beneficial, as many participants had not had the opportunity to practice skills learned in earlier training and several had not attended the previous training sessions. The group was taught how to develop their grade books using Excel software; each teacher received his/her student lists and set up their class roles. Discovering how easy it proved to be to average grades was a selling point for several doubtful teachers - this new technology system was indeed worth it!

On September 8, two trainers introduced email to seventeen participants. The system was not totally stable; therefore participants were introduced to email on Microsoft Outlook and were able to email among themselves within their own network. This training was scheduled from 3:00 to 5:00 PM after school classes had dismissed. Students were still present on the campus. This and other duties and responsibilities kept teachers from being able to focus on the training. The training team returned on September 20. By this time the system was more stable. The two trainers reviewed the email process and introduced the Internet. Participants continued to request more time on the computers to practice and explore new sites. One of the favorite web sites that this group discovered and continued to enjoy was the Blue Mountain Electronic Greeting Cards. For months following the training, the group sent each other and friends animated, on-line greeting cards from this site. Trainers received cards from the teachers as well as various requests assistance email.

Two additional trainers, an undergraduate student worker and a graduate assistant, were added to the team for the October training sessions. The team taught the participants to employ key word searches using various web search engines. The curriculum utilized Yahoo, Infoseek, AltaVista, Excite, the ERIC database, and several on-line dictionary and encyclopedia services. The afternoon was spent exploring collaborative web based projects. Using the curriculum, *Virtual Architecture: Designing and Directing Curriculum-Based Telecomputing* (Harris, 1997), as a guide, the group located and reviewed web sites that involved information exchange. It was at this point that members of the group began to experience the overwhelming amount of resources that were now available to them and to their students through the Internet.

Three of the training team members returned to Calvert during a regular school day later in the month. The trainers met individually with each teacher during his/her conference period to address specific staff development needs. Many of the teachers reported that they appreciated this individualized attention and asked questions that they were not comfortable asking in front of the large group.

In November, three trainers continued to guide the participants through the remaining two activity structures: information collection and analysis and problem solving. The session commenced with the group in a brainstorming activity, identifying powerful learning experiences. At points during the training, the participants shared with the group interesting web-based educational projects that they had reviewed and related them to the powerful learning experiences that had been identified earlier. The training concluded with guidelines to design a collaborative web-based project.

**Methodology**

This study used naturalistic inquiry as the methodology. This methodology allowed the researcher to develop working hypotheses and grounded theory within the context of the schools. The interview process began with the school principal and superintendent and then used the snowball sampling technique (Babbie, 1989) for suggestions of additional respondents. Site technology coordinators, technology trainers, learning specialists, external consultants, and high, middle, and low-using computer technology teachers were interviewed. All of the respondents and school levels were coded to ensure confidentiality by using a one or two letter designation and number corresponding to the type of position in the school and the consecutive order of the interview.

For this study a variety of qualitative methods were implemented to help "ensure truth value, applicability, consistency, and neutrality:" (1) prolonged engagement and persistent observation, (2) interview protocol development, (3) the interview process, (4) member checking, (5) triangulation, (6) and a reflexive journal (Erlandson, Harris, Skipper & Allen, 1993). The constant comparative method was used for the data analysis (Lincoln & Guba, 1985). This method includes four stages: (1) comparing incidents applicable to each category, (2) integrating categories and their properties, (3) delimiting the construction, and (4) writing the construction. For the first stage, the researcher studied the transcriptions and reconstructions to determine trends in the data from the varying perspectives. Each idea (unit) was initially listed without placement into categories. The investigator drew upon tacit knowledge in making these initial judgments for early category formulation.

The transcriptions were analyzed (Newlove & Hall, 1976) to give a glimpse of the individual concerns and innovation-decision process. As concerns were identified in the interview transcriptions, tally marks were made to determine percentages of concerns (self, task, and impact). Delimiting of the construction occurred as the data sources became saturated and the categories integrated.

The analysis of the interviews of principals and technology trainers provided additional insight into needed professional development strategies. This data will be discussed in the concluding sections.

**Research Findings**

The researcher did not pre-determine the profiles of the subjects in this study. Respondents were selected based on the nominations of their peers or supervisor, regardless of subject matter taught, total number of years teaching, and how they were trained or received exposure to technology; an 87% response rate was obtained in this study. The findings of this research are summarized into years of teaching experience, percent concerns expressed (self, task, and impact), and how teachers received their technology training/experience. The profiles of high, middle and low using teachers provide a snapshot of the use of computer technology and telecommunications.

Teachers were placed into user categories; by combining the data into high, middle and low teacher profiles, trends were more obvious. Average totals were included at the end of each user category. Notable trends were found in years of experience, percent concerns and technology exposure.

Years of experience revealed differences between high, middle, and low users of technology. High users averaged 17.5 years of experience compared with low users at 10.0. Teachers who were relatively new to the profession, but who felt comfortable in their teaching and/or technology, were most often high users.

In the areas of concerns and training exposure, concerns of **high** users were most often **impact** and **task** concerns as compared to **low** users whose largest concerns were **self**. Middle users fell in between. Specific examples of expressed concerns were used to develop the recommendations at the conclusion of this paper. In addition, training/exposure to technology showed that 11 out of 13 high users of computer technology and telecommunications had access to a computer prior to this study. Most "learned by doing" rather than courses or workshops.

Table 1

| Code | Years of Subject Experience | Subject | Concerns | | | User of Technology | | |
|---|---|---|---|---|---|---|---|---|
| | | | Self | Task | Impact | High | Medium | Low |
| 1 | 18 | Reading | ● | | | | ● | |
| 2 | 9 | Math | ● | | | | | ● |
| 3 | 16 | Administrator | | ● | | ● | | |
| 4 | 14 | Science | | | ● | | ● | |
| 5 | 20 | English | | ● | | | ● | |
| 6 | 6 | English | | | ● | | ● | |
| 7 | 14 | Business | | | ● | ● | | |
| 8 | 5 | Math | | ● | | ● | | |
| 9 | 31 | Administrator | | | ● | ● | | |
| 10 | 20 | All Subjects | | | ● | ● | | |
| 11 | 5 | Science | ● | | | | | ● |
| 12 | 23 | Science | | ● | | ● | | |
| 13 | 19 | History | | ● | | ● | | |

**Conclusions**

Conclusions are based upon the original research questions. In responding to research question #1, the percentage of concerns that were self were 23%, for task were 38% and for impact, were 39%. As for as how the teachers fell on the continuum of users of computers and telecommunications, 23% were high users, 46% were middle users and 31% were low users. Those responding with high concerns for self most often submitted arguments as to why they felt their positions would not ever be replaced with a computer.

In the second research question, the findings closely matched Rogers' diffusion of innovation research and the Concern-Based Adoption Model for innovation and diffusion. The high users in this study matched Roger's innovators and early adopter category by demonstrating more opinion leadership and risk taking tendencies. Higher users of technology had a more favorable attitude toward change, were more able to cope with uncertainty and risk, less fatalistic, had higher levels of motivation, more social participation, and greater exposure to communication channels. Higher users of computer technology actively sought information about training, software, and applications to the classroom and were more likely to be participating in leadership positions, such as technology or site based management teams. The middle users were more deliberate, succumbed to peer pressure and were more skeptical and cautious. The low users matched Roger's laggards with less interest, more suspicion and resistance.

The stages of concern were an indicator of the diffusion process in a different way. For example, the interactions with a person who has high *self* concerns may be quite different from those with someone with high *impact* concerns. Movement through the stages of concern cannot be forced, but, with appropriate support and assistance, can be facilitated. At the same time, a lack of assistance or the wrong kind of support can interfere with developmental changes in concerns. Concerns are influenced by participants' feelings about an innovation, by their perception of their ability to use it, by the setting in which the change occurs, by the number of other changes in which they are involved and, by the kind of support and assistance they receive as they attempt to implement change (Hord et al., 1987).

In regards to the final research question, several factors contributed to the overall diffusion of computer technology and telecommunications. The degree of computer technology and telecommunication diffusion in this case, the concerns of personnel, and administrative factors all work together in the change process. It is evident that the diffusion process is a complex, dynamic continuum, with many factors influencing the change process. By understanding the types of individual concerns and the relationship of concerns to the use of an innovation, an entity can develop a professional development model and interventions for diffusion. "Based on research with concerns-based concepts, it is clear that the day-to-day actions, or interventions, are keys to the success or failure of change attempts. Indeed, these interventions are the keys to understanding the dynamics of facilitating change" (Hall & Hord, 1987, p. 142). According to Hall and Hord, "an intervention is an action or event or a set of actions or events that influences use of the innovation" (p. 143). Intervening engages many actors who work with many targets in a variety of ways to make change happen. Formal training is obviously necessary, and informal monitoring of implementation must occur regularly.

**Recommendations**

Interventions must be logically related to the needs of staff and the use of the innovation. Through communication and information transfer, individuals begin to network informally about the possible benefits of the innovation. Through formal training and professional development, individuals gain the skills, knowledge and attitude to be successful with the innovation. Individuals must not only have training on the use of the technology, but on how the innovation can become a part of their training or teaching repertoire. The train-the-trainer model allows individuals to develop units and teaming with technology as a tool, not the focus (Siegel, 1995). Concentration on technology to the exclusion of human factors is a prescription for failure.

There are six distinct categories of interventions: (1) developing supportive organization arrangements, (2) training, (3) consultation and reinforcement, (4) monitoring, (5) external communications, and (6) dissemination (Hord, et al., 1987). Intervening engages many actors who work with many targets in a variety of ways to make change happen. Based on this researcher's findings and data analysis, following are recommendations for practice specific to diffusion of computer technology and telecommunications. These recommendations are listed with consideration for the human factors first. Although these recommendations are made for the school studied, implications exist for the consideration or application of these recommendations in other environments.

Interdisciplinary teams/clusters should be formed; one teacher should be placed on each team who is more knowledgeable technologically to help integrate technology throughout the team. This could also be achieved by having at least one "tech" person on each wing/hall and or content area and preferably giving that person an extra conference period to help facilitate individuals in the vicinity of the building or academic area. This enables proximity and similar interest to help infuse the technology in a non-threatening environment. The technology leader on each team should have additional training and exemplify the characteristics of innovators or early adopters (Rogers, 1983).

In-service training and college courses are still lacking and are not the solution for a quick fix! Teachers training teachers works best, but takes longest. For this school, informal training was most effective. The peer pressure and informal network of placing technology experts on each team will enable the low users to gain knowledge and skill, without becoming angry that it is forced upon them. If training is initially directed to those who are interested and motivated, these teachers can train the other teachers (and be placed on the interdisciplinary teams.

The school in this study had many technological resources. Most of the teachers are using the technology, at least for management tasks. Being a new teacher or a low user in these schools could be intimidating. Most teachers do not want to admit that they do not know procedures. There should be an orientation program for new teachers to demonstrate what resources are available and the procedures for using those resources. The new and low using teachers have more self concerns and need more support and guidance. A collegial mentor program, where a new or low using teacher is matched with a peer who is "just a step ahead of them," will allow these teachers to have many of their personal concerns addressed. This person should **not** be a technology trainer or high user, because the knowledge/skill gap is too great. It was indicated in this study that middle users act as helpers to the low users and are not as intimidating because they have recently been through the learning process. This collegial relationship needs to be non-threatening and related to the individual's subject area or managerial needs. If teachers see the benefit of saving time to average grades, or the integration of technology into an existing unit, these teachers will begin to overcome the resistance.

Diffusion and change studies can be translated into a variety of different contexts and to a vast array of innovations. With the introduction of computers in schools, there are significant changes in the school organization

and roles of the teachers, administrators, parents, and students. In order for education to institute change, it is imperative that school personnel understand the diffusion process and its implications for success or failure of innovations.

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# Distance Education: Examining Emerging Standards and Instructional Practice via Videotaped Content Analysis

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*Previous research shows that traditional-type instructional strategies are being used in distance education because there has been no training to distance teach. Secondary data, however, appear to suggest emerging practices which could be pooled toward the development of standard practices to distance teach. The findings of this study revealed that of the emerging practices suggested by proponents and by faculty who teach distance education courses, few were practiced, and those practiced were used minimally.*

*Keywords: Distance Education, Higher Education, Instructional Delivery Methods*

This study was conducted against the background that as distance education changes the landscape of education and training, traditional trainers and instructors will need to adapt or change strategies to be effective. In fact, Holmberg (1995) has noted that faculty need information about dialogue and discourse in distance education as opposed to the distribution of distance education. Charp (1998) has noted that "with all the studies and documentation available, research on why and how use of technology is effective in education remains minimal" (p. 6). As technology improves and the wave of distance education programs grows, it will be necessary to evaluate if traditional instructional delivery methods will yield the best results in distance education or whether other methods *would make* distance education more effective and even superior.

**Problem Statement and Theoretical Framework**

The need for this research was based on the concept widely held by experts, that distance education is different from traditional education, and that instructional delivery methods for distance education should, therefore, be different. It would appear that instructional delivery methods are key factors for effective distance education (Black, 1992; Cordover, 1996; Dillon, Hengst & Zoller, 1996; Holmberg, 1995). From the perspectives of students "talking heads prevail." Students reported in one study, that "their instructors used a variety of teaching strategies–with lecture and discussion as the two most common" (Bozik, 1996, p.99). Research is therefore necessary to examine what instructional standards exist, and how higher education faculty practices these. This study sought to answer following research questions: (a) To what extent are standard practices being followed in instructional delivery?; (b) What is the faculty's rationale for the instructional delivery methods implemented at the higher education level of distance education?; and (c) What are the factors that cause some faculty to practice more of the emerging standard delivery methods than other methods in distance education?

A number of theories informed this study. According to Keegan (1993), "distance education can be seen from the perspective of three developmental stages—correspondence, teleconferencing, and computer-based learning'' (p. 17). Keegan believed that the foundation theories for distance education essentially lie in the grounded theories of general education. However, he was quick to point out, "but not within frameworks of group-based, oral instruction" (p. 66). His revised view of the theoretical approach for distance education was motivated by Peters' concept of industrialization in distance education that "from many points of view conventional, oral, group-based education is a pre-industrial form of education" (in Keegan, 1986, p. 81).

Garrison's facilitation approach has been that of "communication and learner control" (1989, p. 36). Underlying this notion has been the necessity for two-way communication and the necessity for interaction with the teacher. Garrison saw the distance learning process as a facilitated one, and technology as necessary for this interaction. He has argued that technology and distance education were inseparable and that theory and practice in distance education have evolved based on the increasing sophistication of instructional technology.

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**Instructional Theory in Distance Education**

Ostendorf (1989) pointed out that television has been generally considered an entertainment medium where participation is passive. The challenge for the distance education faculty in higher education then has been to use a passive medium to generate action in students. She has offered suggestions such as combining lecture with a pre-distributed worksheet with intentional blanks to be filled in. "This technique is especially useful for a complex topic that would be difficult to cover in less than 10 minutes" (p. 23). Hudspeth and Brey (1985) demonstrated how visuals can eliminate the "talking head" through creative planning:

> The faculty outlined the teaching points, shot and edited several rolls of color slides that they used by projecting pictures on a white piece of cardboard in the studio (picked up by one of the two studio cameras), and prepared an excellent supplementary program on word processing. This was not a "talking head" program. Between a simple chalkboard and 35-millimeter slides, teaching points were adequately visualized and few students realized that this was a very low cost production. (p. 56)

The importance of interaction in distance teaching has given way to interactivity becoming a generic term of distance education. It is believed that for distance education to be truly effective, instructional delivery methods should be interactive. Interactivity has some limitations, however. For the most part, active class discussion is one of the most common methods, but with large groups this interactive method could become unwieldy and defeat the purpose for which it was intended. Cranton and Weston (1989) have maintained that the group should be small and probably under 30 in a face-to-face situation if everyone is to participate. Of course, for the television teacher, there should be no such thing as a group in the teaching transaction even though the instructor is aware there is 100 individuals grouped together. The medium of television caters to one in a mass at all times, which is another reason why television teaching should be different from face-to-face traditional classroom teaching. However, we believe the size of that group becomes important when instructors want to call on each student for individual feedback and in considering turnaround time for feedback on written assignments and personalized instruction. Cranton and Weston (1989) have added that the reservoir of resources which adults bring to the learning experience should be utilized. The "emphasis can be placed on discussions, problem-solving exercises, group work, case studies, role-playing, simulations and field experiences" (p. 8).

**Adult Learning Theories**

It would appear from the literature that there is no one theory which could singularly describe how adults learn. Gagné (1985) has suggested certain relationships, which are essential, ranging from gaining attention to enhancing retention and transfer. Behaviorists such as Thorndike (1928) and Skinner (1974) attribute adult success in learning to their ability to remember only for utilitarian reasons and through repetition. However, central to distance education must be the theory of self-directed learning. The idea of self-directed learning was anathema to the traditional pedagogy to which people had grown accustomed. It was this perception of self-directed learning that propelled both Houle (1984) and Tough (1978) to carry out studies that would define self-directed learning as another method of adult learning.

**Methodology–A Content Analysis Approach**

For the purposes of this study the institution and the participants were assigned pseudonyms to preserve the anonymity of both. The institution is herein referred to as Sunny University and the participants (N=5) are Ashley, Francis, Jerry, Sydney and Toni, all of whom were full-time faculty at Sunny University–a four-year traditional institution. This was a qualitative study which employed the constant comparative analysis approach of Strauss & Corbin (1990) as applied to videotaped content.

A sample of videotapes representative of all courses (Spring (1997) semester) and participating faculty (N = 5) was selected for observation and content analysis. Content analysis is not normally employed as a data collection procedure for instructional content, and, to date has not been used in distance education research. This study represented a unique opportunity to apply a traditionally media-related research technique to educational data. Cognizant of the increasing impact of media-related technologies on distance education, the researchers combined theoretical sensitivity and existing theories with content analysis to design a time-sampling technique unique to videotaped instructional content (see Figure 1).

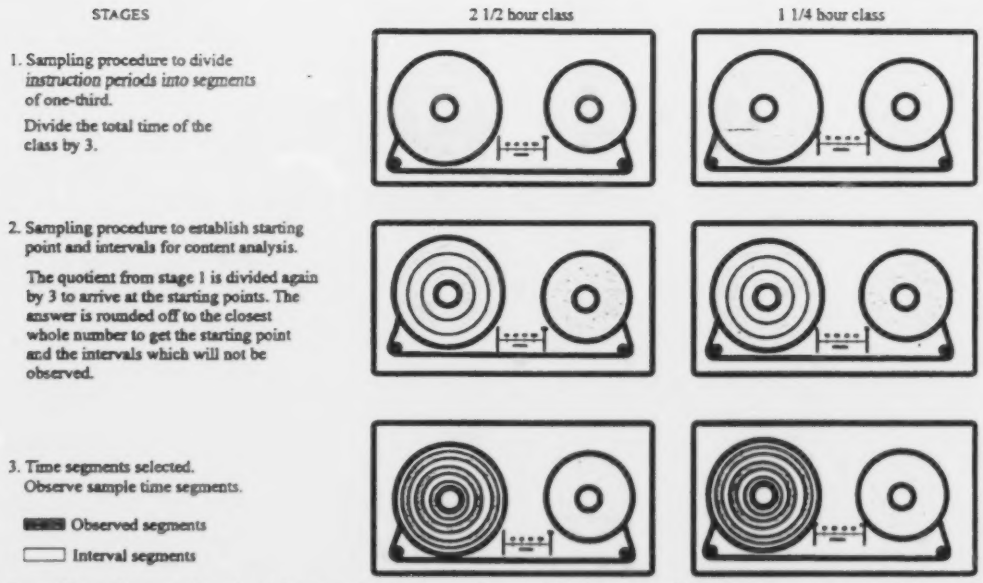
STAGES
2 1/2 hour class
1 1/4 hour class
1. Sampling procedure to divide instruction periods into segments of one-third.
Divide the total time of the class by 3.
2. Sampling procedure to establish starting point and intervals for content analysis.
The quotient from stage 1 is divided again by 3 to arrive at the starting points. The answer is rounded off to the closest whole number to get the starting point and the intervals which will not be observed.
3. Time segments selected.
Observe sample time segments.
Observed segments
Interval segments

*Figure 1.* Sampling instructional videotaped content—A model for sampling time segments for content analysis of instructional material.

The rationale for observing the videotaped content in three distinct portions of beginning, middle and end was to secure a third of the actual lesson time for viewing in a way that represented different portions of the teaching transaction. The observation period for a 2½-hour class was the 17th minute to the 34th minute (rounded off from quotient of 16.66). The middle was from the 51st minute to the 68th minute, and the final portion was from the 85th minute to the 102nd minute. For 1¼-hour classes using the same sampling technique, the beginning point of observation was from the 9th minute, the middle from the 27th minute and the final portion from the 45th minute. For each faculty member teaching a 2½-hour session the total number of minutes observed was 459 minutes, and for the 1¼-hour sessions, the total was 243 minutes. This sampling technique is couched in Holsti's notion of flexibility and representativeness in sampling for content analysis. Holsti (1969) has posited that in the event that "every source is not considered equally important for the purpose of the study [that a] purposive sample may be drawn to reflect qualitative or quantitative aspects of the sources which are deemed important" (1969, p. 130). In addition, there are special characteristics for the beginning, middle, and ending portions of an educational transaction. In accordance with the research question the unit of analysis (that which is counted) was instructional delivery strategies used by faculty. The categories were adapted from Cranton & Weston's (1989) typology (Table 1) and formed the etic (analyst-constructed categories) during observation.

Table 1
*Etic Categories for Coding Instructional Delivery Methods*

| Instructor-Centered | Interactive | Individualized | Experiential |
|---|---|---|---|
| *Lecture* - students passive | Class Discussion - student involvement | Programmed instruction- students receive extensive feedback; students work at own pace | Role-playing - active student participation |
| Questioning - encouraging student involvement; monitoring student learning | Discussion Groups - students participate in group work | Independent projects - students are actively involved assigned projects during class time | Simulation - active student participation in situational experiences during class time |
| Demonstration - instructor illustrates - uses examples, anecdotes, graphics | Group projects - students given assignments to be worked on in groups during class time | Computerized instruction - Instructor uses e-mail or other CAI methods of instruction | Laboratory - active student involvement in a realistic setting |

**Researcher as Instrument**

We brought to the project some bias about what is expected in a distance education course taught via PictureTel and were the main instruments for data gathering and analysis. From a communication and teaching perspective, the feeling is that enthusiasm, personality, and a general knowledge of the medium one uses to disseminate information is essential to good teaching, regardless of the medium. From the literature and our own observations, we have learned that the majority of the instructors now teaching via distance education have come out of traditional teaching situations and have resisted major adaptations to accommodate the new medium. Because distance education is very different from the traditional classroom, it follows that there needs to be some readjustment on the part of the traditional instructor who wishes to teach via television. In this regard, we feel the distance education faculty, while expert in their content area, need to be trained for the new challenges of teaching via television.

**Data Analysis Strategy**

The instructional delivery methods practiced by faculty were identified and counted through observation of videotaped material of the televised instruction on PictureTel. A number of categories were named in the first round of coding. These data were identified, counted, and provisionally analyzed through interpretive analysis. In the second round of coding, we decided that the parameters for coding had to be expanded to include non-instructional strategies given the technical and administrative categories that were emerging. A further refining of categories was achieved by reviewing the samples againand, in one instance, reviewing the entire videotaped lesson. During this phase, verification of categories was the objective, and, where there was an overlapping of categories, these were either subsumed under a broader category or placed in a separate category.

**Findings, Conclusions and Limitations**

The majority of the instructional delivery methods practiced were instructor-centered and concentrated heavily on three major strategies: lecture, questioning, and demonstration (see Table 2). Guest speakers (3 instances observed) emerged as a category and were coded as an instructor-centered strategy. These were coded as such because the guest speakers only employed the lecture strategy interspersed with questions and demonstrations. Observed interactive strategies focused more on class discussion than on feedback or on group projects. There was no clear distinction that necessitated creating a category for discussion groups and another for group projects, as the activities almost always overlapped; therefore, these two strategies were collapsed into one category (group projects) which clearly described both functions.

Table 2.
Observed Instances and Examples of Instructional Delivery Strategies by Faculty (N=5) Teaching via PictureTel at Sunny University*

| | Instructor-Centered | | | Interactive | | | Experiential | Individualized |
|---|---|---|---|---|---|---|---|---|
| Instructors | Lecture | Questioning | Demonstration | Class Discussion | Feedback | Group Projects | Role-play | Independent Projects |
| Sydney* | (7) Explanations; Talk on subject matter (2) Guest speaker | (5) Logistics Text, Instructor to student | (1) Video shown (1) Anecdote | (7) Reports, syllabus, and student to student | (0) | (2) Students talk about chapters in text | (0) | (3) |
| Francis* | (14) Subject matter | (13) Activities Verification | (10) Diagram video, overheads, illustrations | (1) Discussion on answers | (1)Instructor repeats information | (4) Cohort exercise, projects from Study Guide | (0) | (1) |
| Ashley* | (15)Defines, explainssubject matter (1) Guest speaker | (14) Student to instructor, Instructor to student | (7)Diagrams (1)Anecdote | (5) Term paper, technical terms | (1) Informs on term paper results | (0) | (0) | (0) |
| Toni* | (12) Subject matter | (16) Student to student, Instructor to student | (13) Graphics and captions (3) Anecdotes | (6) Lead-ins, question and answer | (0) | (0) | (5) work-related relationships | (1) |
| Jerry* | (16) Subject matter | (16) Instructor calls on students at remote site | (6)Writing on board, typed illustrations | (2) Student to instructor and instructor to students | (4) Repeats information, repeats questions | (0) | (0) | (0) |

*Pseudonyms.

What has emerged at Sunny University is corroborated with what was found in the Dillon et al. (1991) study. Also instructive in the findings of this study was that one instructor who claimed no previous teaching experience used more non-lecture methods than the other four instructors who were seasoned traditional instructors. This would seem to bear out the notion that traditional teachers need to modify their teaching to fit the distance mode. However, one important point that should not be overlooked in the data for instructor-centered strategies is the volume of questioning which instructors at Sunny University did. These data may suggest a concerted effort on the part of instructors at Sunny University to depart somewhat from the straight lecture method and to move closer to teaching for the distance mode.

Readers are cautioned not to infer that interactivity was a high point in the instructional strategies practiced at Sunny University because there were 64 instances of questioning. Questioning, while generating two-way communication, was rarely directed at distance students and did not constitute feedback, which was rarely practiced and was regarded by proponents as integral to interactivity. In fact, the data from observations showed that except for a very deliberate attempt by one of the instructors of this study, most of the questions were directed to on-site students. This would indicate a clear violation of Holmberg's (1995) claim that interactivity in a non-contiguous communication process is being able to give effective feedback and help the distance students keep track of their progress. Holmberg's claim also seems to support Zigerell's notion that "non-interactive or one-way video encourages passivity in learners" (1991, p. 64).

The analysis of these data showed that while faculty practiced some of the emerging practices recommended by themselves and by proponents, that the actual application of these emerging practices was haphazard. For example, everyone lectured, but none of the instructors made use of Ostendorf's (1989), Zigerell's (1991), and Willis's (1993) recommendation not to lecture for more than 20 minutes at any given time during the distance education transaction. The instructors did introduce interactivity by asking the students if they had any questions, but the teaching time spent on lecture far outweighed the teaching time spent in interactivity between the instructor and the remote-site students.

**Rationale for Emerging Practices in Use**

The in-depth interviews with the instructors illuminated several areas related to the research questions. For example, it did not appear as if they had a choice in using PictureTel. From all accounts, the university was going to attempt distance teaching and instructors were asked to participate. As Ashley stated, "Well, first of all, I was asked to present this particular course or this segment of the course; it was a new course for me. Then I was also told that it would be presented via distance learning." Ashley was not, however, enamored with the technology at all: "The information, the content being presented, can be presented via any medium, and PictureTel is just another mechanism to present the information to another area—to a distant area".

Francis, while appearing very relaxed with the technology during the presentations, also appeared to have had to embrace distance education and the technology with no previous exposure: "cold turkey. . . .I literally started off that course with little or no preparation." None-the-less, the instructors defended the instructional strategies used. Toni used a more instructor-centered approach in distance teaching and justified it, saying the approach was used "because the students tend to look for more direction."

> They say the students at the distance sites tend to be more passive than students at host sites, and what I've experienced is if the instructor doesn't take an active role in building that student participation, they become lethargic and simply watch what's going on as opposed to becoming a part. So rather than giving more freedom to the student to guide the direction and to lead the discussion, those kinds of things, I think is not necessarily good in my classes. It may be appropriate in some other classes. There is a reason for that because my students tend to be more traditional students than non-traditional students. If they were non-traditional students, more mature, more self-directed, I think then the scenario might be different. (Toni, March 1997)

Sydney articulated that PictureTel was just one element. "The method by which I reach [the students] is fairly neutral." Sydney claimed, "My subject is not teaching through PictureTel. My subject is using technology to reach the learner and to teach something to the learner to give them valuable insight." Sydney believed that the students taking the course should be self-directed and, as such, the strategies employed were appropriate.

> My teaching method is based on student participation, discussion, case studies, and also it implies that you have to have more graphics when you teach, and this is not always what people do. So, I have to prepare

> graphics. I have to prepare slides that they will be using, and that I will be using to show them some of the things I want to tell them. So you have to be visual and auditive as well. You can't be only auditive. (Sydney, March 1997)

Jerry recognized that the intimacy of the traditional classroom was no longer available to the distance teacher and was compelled to adopt the strategies that would allow for ultimate control of this new classroom:

> I have the feeling that I need to use more graphics, more images, and I don't know why in distance learning do I need more images if they're really the same, you know, but it's just something that comes out from within me. I feel that it's the right thing to do, you know, probably. Now that I think about it, it's probably because I want to have, like, double safeguards. Before, I could just talk to a class and if something wasn't too intelligible to them, then it's very simple to just switch and do something else on the board. But since we have this tenuous connection already, I guess I don't want to mess up. I want to be doubly prepared. (Jerry, March 1997)

Jerry made no apology for not using a learner-centered approach in teaching via PictureTel. This instructor made reference to conducting several group discussions in a face-to-face situation but noted that the lack "of confidence in this equipment" would cause problems of control of the class from a distance. To Jerry, control was an important part of the teaching equation; Jerry affirmed, "I haven't used the learner-centered approach at all." The instructor took the justification further:

> Theoretically I could [use a learner-centered approach] but I'm worried about the control. You know, when you have this group of students up at the front and the others are sitting back there making faces and I can't see them. . . things get out of control at the [remote site]. (Jerry, March 1997)

**Factors for Differences in Use of Emerging Practices**

The data generated from observation of videotape and in-depth interviews revealed the following findings as major factors accounting for the differences in use of emerging practices: time constraints; subject matter; student type; experience; technology used; personality; competence with technology; philosophy of distance education; and adapting for distance education. With Francis there was a pacing problem; questions coming from the distance site indicated that students were concerned about the speed of delivery. As a matter of fact, Francis said there was a lot to be grasped in the courses: "[The courses] are laying out the framework, the basic knowledge-based concepts, theories, definitions, history, philosophy and so forth upon which the field is based." However, even with that thinking, the proponents of distance education have maintained that instructors teaching via television must pace both content and delivery to accommodate the separation factor in distance teaching. As Willis (1993) has said, "The pace should be slower for new material and faster for review. . . .Diversify and pace course activities and avoid long lecture" (p. 107).

Jerry wrote extensively on the chalkboard. The instructor insists that because of the subject matter, putting the matter on overhead projection would not be the same: Zigerell (1991) has suggested that the television screen might not be the best place for displaying material written on a chalkboard. "It [meaning the television] is not good, for example, for displaying illustrations and graphics that require wide eye span" (p. 64).

All five instructors had to prepare more for distance education classes than for their other classes and all believed that if the technology did not fail them so often, the experience would have been more worthwhile for everyone. As Jerry put it, "It's not distance learning; it's the equipment."

**Conclusions**

We concluded from the data that emerging standard practices (identified in the literature) were used minimally, and that traditional lecture was still dominant in distance teaching. Dillon, Hengst, and Zoller (1991) support these findings. In their study they found that two-thirds of the courses taught were instructor-centered strategies. A more recent study, (Cordover, 1996) while not examining instructional strategies of instructors, concluded that traditional instructors needed training to perform successfully in the distance education environment. Emerging concerns evolved from a large section of emic (that is units discovered rather than imposed) data. It can be concluded that faculty are genuinely concerned about enhancements to the technical system, and general improvements in distance education delivery at the institution. While expressing doubts about the "distance" factor in the program, they

recognized that PictureTel and the operation between the originating sites and other campuses within the same state was a small part of a larger goal for the institution.

**Limitations**

The researchers never anticipated that technical problems would be an important intervening variable in the distance education transaction. No accommodation in designing research questions for this study was geared to addressing how the effectiveness of the technology being used could play a role in the instructional delivery methods of the instructor. Although previous research has acknowledged that technical failures during the educational transaction are not uncommon, it would seem fair to conclude that if the occurrences are frequent, this would increase the transactional distance in distance education and result in negative experiences both by faculty and distance students. Faculty also appeared to create their own downtime in introducing administrative matters during their most captive audience time exceeding durations of ten minutes in some instances.

Although limited in scope, the data from this study can provide insights to faculty that are or intend to teach via the television medium. Further, while the results of this study should not be generalized beyond the population of the study, the findings and recommendations of this study give rise to new theory for greater understanding of the phenomenon studied. Prior research has indicated that training is essential for transitioning traditional instructors into the realm of distance instruction and the data from distance education faculty at Sunny University have validated this finding.

**Recommendations for Practice and Research**

Lecture is a good method, but in the distance education environment, the voice, the person and personality take on more meaning than in the traditional setting. The instructor has to essentially relinquish the old way of thinking and mentally prepare to be on television. Scripting takes on special significance geared toward talks of 10-15 minutes rather than lecturing for hours. A study guide appears to be the "Bible" of distance courses as it provides the distance students with something concrete containing the objectives, activities and expected outcomes of the course. Ongoing faculty development is critical, as the changes and advances in technology are rapid. Further research should be done to compare the effects of traditional techniques and distance education emerging practices on learning.

Note. From Planning Instruction for Adult Learners (p. 84), by P. Cranton and C. B. Weston, 1989, Toronto: Wall & Emerson, Inc. Copyright 1989 by Wall & Emerson. Adapted with permission.

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# Critical Components of Distance Education Partnerships between Two-year Colleges and Business and Industry

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*There is a lack of planning data that can be used by two-year college administrators and training program practitioners in developing, funding, and monitoring partnerships in distance education environments. The goals of this multiple case study were, (1) to identify critical characteristics of program planning, funding, evaluation, and policy development in distance education partnerships and (2) to create the framework for a program development model for the planning and refinement of distance education training programs.*

*Keywords: Distance education partnerships, Distance education policy, planning, & evaluation*

The future role of continuing education programming provided by two-year technical and community colleges is filled with questions and speculation (Gross, 1995). Demographics and instructional technologies are changing and distance education will affect their future, but the extent of which is unknown. Two things are clear: (1) the need for continuing education, especially in business and industry, is greater with the current transition from an industrial to an information society than it has ever been in the past and (2) financial resources are scarce in higher education and are constantly being divided to cover the costs of more and more services (Gross, 1995).

For a number of two-year college systems across the nation, especially those in western states, answers have been found in the development of an aggressive distance education program (Western Interstate Commission for Higher Education, 1983). Distance education is not a new concept. In fact, distance learning is as old as correspondence education--an arrangement that has provided learning for thousands of students in many parts of the world. In the face of economic constraints, political pressures, and technological developments, interest has developed in formalizing arrangements between universities, colleges, and other agencies to become partners in distance education (Konrad & Small, 1986). To help defray costs associated with developing and maintaining technologically advanced distance education programs, several two-year institutions in the United States have developed partnerships or consortiums with other public institutions as well as private-sector partnerships. An added benefit has been the enhanced quality and quantity of the continuing education training programs they can offer.

The use of technology in training has grown tremendously over the past several years--tools have improved and produced several important changes in the way training has been designed and delivered (Haag, 1993). Although not every organization has implemented these new design and delivery systems, the number of organizations using them has increased significantly. A 1995 survey of organizations of more than 100 employees indicated that 48% were using computer-based training, 27% were using multimedia systems and 43% were using some type of distance learning system to deliver training (Industry Report, 1995).

The use of technology-based delivery systems in the training process has many potential benefits for organizations. For example, the use of computer-based technology in the design and delivery of training can result in greater learning gains, more consistent and acceptable job performance, enhanced cost-effectiveness and greater flexibility regarding time and locations of training (Hannum, 1990). Technology can also help address the needs of geographically dispersed trainees and reduce the need for classroom facilities (Perlstein, 1993). With the advent of globalization, more and more trainees are instructed through satellite delivery systems and computer-based software and training systems. Barriers are often present in organizations that inhibit the successful integration of distance learning technologies. These barriers may include high costs, lack of management support, lack of trainer skills, failure to adequately identify needs and to analyze financial benefits of distance learning (Gery, 1994). If two-year community and technical colleges are going to continue to be worthy training partners for globalized organizations in the next millenium, they must understand the barriers organizations face in integrating distance education programs. Furthermore, two-year community and technical colleges need to be able to provide proven planning and adoption models to help organizations overcome these barriers.

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**Distance Education in Texas**

In 1995, the 74th Texas Legislature passed "The Telecommunications Act" (House Bill 2128, 1995), and with it set aside $150 million in annual funding for telecommunications over a ten-year period. This money has been designated to fund grants and loans, with a priority given to distance education and the collaborative efforts of schools and universities (Texas Department of Information Resources, 1995). Another way the Texas state leadership demonstrated a commitment to distance education was through the development of a Distance Learning Master Plan for Higher Education (Texas Higher Education Coordinating Board, 1996a).

Higher education leaders in Texas also addressed the use of new technology as an integral part of the curriculum. The Texas Higher Education Coordinating Board's (1996b) *Guidelines for Instructional Programs in Workforce Education* made specific reference to advances in professional development and multimedia. Specifically, the Coordinating Board guidelines stated that, "All institutions shall demonstrate promotion of teaching excellence by implementing professional development activities for all part-time and full-time faculty." Such activities include "new technologies and curricular applications and the use of technology / multimedia / telecommunications in instruction" (p. 8).

As justification for the above guidelines, the Texas Higher Education Coordinating Board (1996a) had found that more institutions were participating in distance education than ever before. The Coordinating Board surveyed the state's 166 higher education institutions and found that, during the 1993-1994 school year, 50 of those institutions offered courses for credit via instructional telecommunications. They added that this trend was expected to continue and that the growth rate should accelerate. The Coordinating Board cited two primary reasons for its support of the pursuit of distance education: (a) to meet the needs of the under-served population and (b) to increase course offerings in disciplines designated as occupational shortage fields. Additionally, since Texas is geographically the second largest state in the United States, distance education systems are critical to transcend the geographic challenges, especially in the western half of the state.

While Texas would not be considered the leader in distance education programs, certain universities and two-year colleges have developed some rather sophisticated distance education programs. The most remarkable programs, in terms of breadth of programming and number of students served, are those in the three schools that were studied for this research.

The Texas Higher Education Coordinating Board's (1996b) *Guidelines for Instructional Programs in Workforce Education* designates the two-year community and technical colleges as the primary providers of workforce development programs. It is a natural consequence that those same institutions take a leadership role in distance education partnerships with private business and industry. It was the intent of this study to identify, research and report specifically on those types of partnerships.

According to Hall (1996, p. 45), "distance educators [in electronic or virtual universities] need to forge new partnerships with the traditional university and collaborate in creating new systems, academic course software, and supporting networks for information transmission." In addition to these partnerships, distance educators need to forge partnerships with private-sector entities to ensure program vitality in the areas of effective communication processes, transmission systems, state-of-the-art technologies, and adaptive networks. These processes and systems are necessary to guide the development and delivery of courses and programs to meet the education and training needs of a global society.

**Problem Statement**

Substantial research has been done in the field of distance education that relates to developing, delivering, and evaluating individual courses as well as profiling distance education students (Willis, 1994, Gooler, D.D., Firestone, C. M., & Clark, C., 1992, Niemeyer, D., 1985). *There is, however, a lack of planning data that can be used by two-year college administrators and program practitioners in developing, funding, and monitoring partnerships in distance education environments.* The primary goals of this study were, (1) to identify critical characteristics of program planning, funding, evaluation, and policy development in distance education partnerships between public, two-year colleges and business and industry in Texas and (2) to create the framework for a program development model for the planning and refinement of distance education partnerships in two-year college continuing education training programs.

*Research Questions*

This study attempts to identify procedures and practices related to four critical components of any distance education program partnership (Eastmond, 1994), especially training partnerships between two-year colleges and private business. The following four components and questions of inquiry guided this study:

- Program planning: How was the need for this partnership determined? How were decision-making and planning committees formed? How was equal input sustained from all stakeholders?
- Program funding: *How was the program initially funded? How is it currently* funded? What plans have been made for future funding?
- Policy: Were policies in place to allow for distance learning activities? What were these policies and what changes were necessary to allow for the partnership? What new policies were developed and by which partners?
- Evaluation: What evaluation practices and tools have been developed to capture and reflect the benefit(s) of the partnership for each institution and its students?

**Methods of the Study**

The design of the study incorporated a multiple case study approach that included interviews, document reviews, and observations as the primary methods of data collection. The three cases selected for this multiple-case study were distance education partnerships between public two-year colleges in Texas and at least one private-sector business or industry. The following considerations guided the selection of each case:

1. The three programs selected represented a variety of two-year institutions and/or a variety of private-sector businesses or industries.
2. The programs selected represented a variety of student/learner populations and/or geographical demographics.
3. The partnership selected were a current practice at the time of investigation (programs in planning stages could be considered).
4. Curricular offerings of the partnerships were delivered via distance learning technologies that included: (1) two-way audio and/or video transmission utilizing microwave, fiber-optic, satellite transmissions, etc., (2) the Internet.

For each case, interviews were conducted with the program administrator from the two-year college, the training representative from each company, and at least one instructor from each program. Program planning documents, evaluation tools, contracts and policy statements were the primary documents reviewed in each study and the researcher observed planning meetings and/or actual training classes at each site. Upon completion of data collection activities, the data from each case was closely examined to identify emergent themes.

For this study, a process of coding and comparing information known as thematic analysis was utilized to achieve data convergence. "Thematic analysis is a process for encoding qualitative information. The encoding requires an explicit 'code'. This may be a list of themes; a complex model with themes, indicators, and qualifications that are causally related; or something in between these two forms" (Boyatzis, 1998, p. 4-6). To make results from qualitative research accessible to others, one must employ different ways of organizing and presenting them (Miles & Huberman, 1984). Thematic analysis allows the application or use of qualitative information in a manner facilitating communication with a broad audience (Boyatzis, 1998). This multiple case study utilized a process of thematic analysis for the purposes of coding data and identifying cross-case themes.

The cross-case analysis utilized the 'thematic code analysis' process (Boyatzis, 1998) which resulted in the identification of common themes in the areas of program planning, policy, funding, and evaluation in each of the three cases studied.

An audit was conducted at the conclusion of the cross-case analysis. The audit consisted of a review by an external reader of all data including interview tapes and transcripts, researcher's field notes, documentation of the theme and cross-case theme development process, and the written report of the research.

**Conclusions**

The two-year college movement has been filled with adversities as well as opportunities. Access and affordability are the hallmarks of two-year colleges' appeal to students, while flexibility and focus on practice, as opposed to research, are its appeal to business and industry's training needs. Successful colleges in the distance education arena will be those institutions that continue to nurture these current trademarks while continually working to integrate the advantages of a more flexible delivery format.

As with traditional programs in higher education, effective distance education programs include comprehensive program planning activities and program policies that monitor internal institutional activities as well as intrastate and interstate developments. Also, to continue to appeal to their business and industry partners, program administrators at two-year colleges will have to develop sophisticated comprehensive program evaluation tools and methods similar to those used in other private-sector training programs. These tools and methods are applied to measure the impact and quality of distance education based training programs.

High-tech communication equipment, the heart of most distance education course delivery, is being improved at an escalating pace. If two-year colleges cannot develop methods to integrate new developments, their corporate partners will be forced to seek out those institutions, public or private, that can offer state-of-the-art delivery technology.

Overall, program administrators in two-year colleges are facing the challenges of distance education everyday and very little literature exists to help them through the steps of program planning and development. The following emergent themes are intended to assist program personnel in decision making and planning tasks associated with distance education programming with business and industry.

**Program Planning for Distance Education Partnerships**

Distance educators need to forge internal partnerships with traditional programs to create new systems, academic course software, and supporting networks for information transmission (Hall, 1996). In addition to internal partnerships, distance educators need to forge partnerships with private-sector entities to ensure program vitality in the areas of effective communication and transmission systems, and state-of-the-art technology. External partnerships will also help ensure sufficient networks to guide the development and delivery of courses and programs to meet the education and training needs of a global society. In each of the three cases studied, the college administrators initiated the discussion of utilizing distance learning technologies. In case study three, initial training discussions began in the economic development department and were later referred to a distance learning program that was housed at a different campus. This reinforces the notion that effective internal communication and cooperation are critical components of distance education partnerships.

McGill & Johnstone (1994) identified seven considerations for successful cooperation in instances of local, community college-based partnerships. Five of those considerations were reoccurring themes in each of the cases of this study: needs assessment, support from top level officials, consideration of staffing and funding needs, and the inclusion, maintenance, and nurturing of all program members.

In one of the three cases studied, the Concerns Based Adoption Model or CBAM (Hall & Louchks, 1979) was used to introduce the idea of distance education to company representatives. While this is not the only means for introducing a new concept, the CBAM process includes the early involvement of all program stakeholders. This issue was a critical, and sometimes missing, component of each of the partnerships in this study.

While a great deal of the planning was done informally between partners, specific aspects of the planning needed formal documentation. Programming logistics in each case were recorded and distributed to stakeholders in each of the three cases. This not only ensured consistency in planning details and information sharing, it was a critical communication tool for accommodating unknown or last minute changes.

Overall, in each case the college was the partner with the background in distance learning and consequently was the partner that introduced and nurtured the company through the design and delivery process.

**Program Policy**

As noted by Dively (1987), higher education policies and regulations were adopted long before educational technology became a major issue. Some of these policies will not be affected by the growing use of technology. In many cases, the use of technology can be accommodated with minor changes in policy and procedure. With the exception of a minor change in the college registration policy at the school in case study one, no policy changes were necessary to accommodate distance learning partnerships in the two-year colleges included in this research

study. It should be noted that each of the three training programs were non-credit and were under the jurisdiction of continuing education. Traditionally, continuing education programs in institutions of higher education operate with a great deal more flexibility than those in regular credit programs.

Each of the three companies studied had training policies that allowed employees to participate in continuing education programs. The policies typically included time off from regular work assignments to participate in company required training and reimbursement for tuition and related expenses upon successful completion of each course. No company in this study could document changes in current training policies that had evolved from worker participation in a distance education training program.

Based on the partnerships studied in each of these case studies, one may assert that distance education programs will continue to be effective alternatives to meeting workforce training needs. However, meaningful telecommunications policies need to be developed at the local, state, and national levels. According to Gooler (1991, p. 15-17):

> Good telecommunications policies are those which make it possible and feasible for educators to take advantage of the instructional and administrative powers of telecommunications technologies while reducing the risks and costs associated with being involved. Good telecommunications policies make the telecommunications systems as flexible as possible so that teachers and learners can determine appropriate usage. Good telecommunications policies open avenues for more regional and national cooperation among educators and learners rather than impose boundaries to such cooperation. Good telecommunications policies promote equity in access and quality of product and services through telecommunications.

**Program Funding**

Distance education systems were assumed to be a panacea for relieving higher education of traditional constraints of time and space. However, distance education has suffered from different shortcomings and restraints that have made it difficult to operate (Hall, 1996). One problem is the increasing cost of quality distance learning technology. The economic requirements to purchase and maintain the delivery equipment are very different from conventional teaching. As technology improves and user demands become more sophisticated, the traditional structures of classrooms are no longer viable tools (Gaspar & Thompson, 1995). Also, without adequate avenues for initial and ongoing funding, many distance learning systems may fall victim to outdated technology and unreliable telephone and data-transmission services.

Program administrators in each of the three case studies expressed many of these same financial concerns and were well aware of the impact that outdated technology can have on distance education programming. While in each of the three cases the company was responsible for a majority of the financial costs, program administrators in case study one and two had already utilized external funding sources to purchase equipment and to cover some training costs.

The incentives for cooperation in distance education programs are many (Willis, 1994). These three cases indicate that there are and will continue to be many financial incentives for developing and nurturing distance education partnerships between two-year colleges and business and industry.

**Program Evaluation**

A majority of the tools used to evaluate distance education programs are strikingly similar to those used to evaluate traditional programs. Eastmond (1994) suggested choosing a qualitative evaluation strategy that included the instructional materials, the instruction, and the overall program. Each of the program administrators and business and industry representatives in these cases indicated that the evaluation instrument included a fourth area of inquiry: the quality of the delivery technology.

Kirkpatrick (1996) postulated that the evaluation process must include evaluation at the individual and systems level to include all stakeholders in the program. Program and training effectiveness must be evaluated for individual students as well as for overall return-on-investment for each partner. A system designed to allow for both formative and summative evaluation will allow for continuous improvement and program modification.

The three companies involved in this research had designed their training evaluation around Kirkpatrick's model of four levels of program evaluation. Each of the two-year colleges in this study used more general evaluation tools. This disparity between partners led to a rather lengthy process of refining evaluation instruments in order to provide the companies with evaluation results in a usable format. In one instance, two evaluation forms

were completed by program participants. This study indicated that program evaluation components and instruments need to be discussed and agreed upon by all partners prior to commencing with training activities. Given the prevalence of its utilization in the cases studied here, it may behoove two-year college program administrators to become comfortable discussing and designing evaluation instruments based on the Kirkpatrick model.

**Summary**

Data collected in each of the three cases indicated that ongoing communication in and among each of the partners is a critical component in distance education partnerships. Furthermore, inclusion of program stakeholders from each partnership in the planning and implementing of the program is a critical step in creating and maintaining successful partnerships.

Especially in case studies one and three, another critical component was the prior expertise of college administrators in utilizing distance learning technologies in the delivery of training programs and courses. This previous experience proved to not only be useful for internal marketing, but it also appeared to be useful in the external marketing of distance education as a viable delivery format for business and industry training programs. Finally, it was the feeling of many of the administrators, company representatives, and instructors interviewed in this research project that one of the major strengths was the partnership itself. Whether it is for the influence of previous experience, financial and other resources, or simply to keep college faculty and administrators in tune with the workforce development and training needs of the private sector, distance education partnerships need to be initiated and nurtured in two-year colleges.

**Implications**

Existing research suggests that distance education will continue to play a vital role in the delivery of workforce training and effective partnerships will be a major component of its success (Hall, 1996). This study explored critical components of distance education partnerships between two-year colleges and businesses and industries. Very little research has been conducted to assist program planners and administrators in the actual development of distance education programs. The results of this study present an organizational framework for distance education program planning that can be utilized by administrators and program planners.
The organizational framework that evolved from this study has potential utility. However, there are a variety of additional areas of inquiry that need further research. The program administrator in case study three articulated it best when he remarked:

> The account manager from our economic development department and I have been looking for a planning model to follow to put this type of training together. So far, we have not been able to find one anywhere.

While none of the partners in the cases studied during this research had to make significant policy changes, there is clearly a need for comprehensive policies in the realm of distance education. The challenge to federal and state policy makers, as well as program administrators in two-year colleges, is to continue to make distance education policy that will enable institutions to meet private-sector training needs and not force viable training programs to fall victim to unnecessary bureaucratic processes.

As stated earlier, a notable challenge is determining a funding method that can provide start-up monies as well as adequate funding for ongoing system enhancements and upgrades. The partnerships studied in this research provided evidence that there are federal, as well as state-level, revenue sources available in Texas to start programs. The challenge to legislators will be to keep these revenue streams funded to foster new programs as well as maintain existing programs. The success of training programs is measured in part by effective program evaluation tools. This study indicated that the integration of evaluation results is a critical factor in the ongoing success of distance education partnerships. While it may be unique to this study, each of the three companies used Kirkpatrick's Four Levels of Program Evaluation Model. None of the three colleges in this study used Kirkpatrick's model, which led to inconsistency when each partner attempted to make program changes that were based on evaluation results. To streamline the critical step of integrating evaluation results, a detailed discussion of program evaluation tools and methods should be conducted between partners during the initial stage of program planning.

Distance learning technology is a viable delivery method that can benefit from further research concerning distance education partnerships. In addition, further research is needed to refine this organizational framework so it can continue to serve as a useful planning tool.

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